

Appl. No.: 09/800,171  
Amendment dated Dec. 5, 2003  
Reply to Office action of Sept. 5, 2003

## **REMARKS**

### **ALLOWABLE CLAIMS:**

The Examiner indicated that Claims 2-11 and 16 have been allowed. The spelling of the word "arregonite" was corrected to the proper spelling aragonite in Claim 5 and in the specification.

### **CLAIM OBJECTIONS:**

The Examiner objected to Claims 33, 34, 41, and 42 as being dependent upon a rejected base claim, but indicated such claims would be allowable if rewritten in independent form.

Claim 33, was instead further amended.

Claims 34, 41, and 42 are rewritten in independent form as per the Examiner's allowance. Please also note that in the rewritten Claim 34 the phrase "open chamber mixer" was changed to a "closed chamber mixer" as Applicant's attorney was mistaken in stating that the Banbury mixer was an open chamber mixer rather than a closed chamber mixer.

These changes are believed to cure the Examiner's objections, and still make the claims allowable.

### **CLAIM REJECTIONS - 35 U.S.C. § 102:**

Claims 1, 13-15, 17, 29, and 43-50 are rejected under 35 U.S.C. § 102(b) as lacking novelty and as being anticipated by Sullivan, et al. (U.S. Patent No. 5,886,078), hereinafter '078 Patent. Specifically, the Examiner posits that the Sullivan '078 Patent discloses

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polymeric compositions that are suitable for the production of members for use as railroad ties and lumber (Col. 1, lines 5-67), and that such compositions were taught as comprising thermoplastic polymer, rubbery polymer, and mica in relative amounts that overlap those in the current application. The Examiner further contends that the final articles are taught as being formed by both extrusion and molding processes in Column 8 lines 10-12 of the '078 Patent.

Applicants respectfully traverse the Examiner's rejections on the basis that certain features of the members are novel improvements, the mixing and molding processes to form the members are novel, the manner of using the composition is novel, the method of producing members with at least one textured side surface is novel, and none of these novel improvements are disclosed in the '078 Patent.

First independent Claim 1 has been amended to claim the members that have a constant density, wherein the density of the member is controlled during the filling of the mold. There are no such teachings in the '078 Patent.

Next, independent Claim 13 is directed to a novel process for forming a molded member wherein the composite is mixed in a Banbury mixer or other closed chamber mixer, extruding the mixture into a mold, and closing the mold when it is at least substantially filled. Further, the mixing and molding technology used in this application was not even known at that time of the filing of the earlier application and has taken years and millions of dollars to develop. This invention uses a different mixing mechanism, and is superior to that disclosed in the '078 Patent. The mixing in the '078 Patent was accomplished by an extruder. In this invention, Applicants use a closed chamber Banbury mixer to mix the components. This allows formulation of a more homogeneous mixture, which is also preferred since ingredients

can be added at different stages, similar to making a cake. This is especially advantageous since the fillers are preferably added near the end of the mixing stage. Now the extruder is used to pump the mixture as part of the injection process, rather than to mix. Again, the '078 Patent does not disclose this mixing process.

The invented molding process is also novel, and gives the tie different characteristics than the extruded tie or member. Moreover, the method of injection molding, using an extruder in conjunction with a piston and/or gear and/or brake was not known or disclosed in the '078 Patent. While the process disclosed in lines 11-12 of Column 8 refers to injection and compression molding, as by molding a member by compressive forces, there are no teachings of any specific way to mold the tie out of such materials and at that time, the inventors did not know how to achieve molding with those materials. In contrast, in the invention of the '078 Patent, the extruded material flowed through a die and made a member which was substantially the shape of the die and was of unlimited length. Upon exiting the die, the extruded member was directly placed in a cooled water bath where it hardened, and was pulled out of the die by rollers, or a similar type of pulling device, very similar to the traditional way that pipe is made. Subsequently, the member of unlimited length was sawed to size, thereby forming a somewhat imprecise end product. In short, the '078 Patent disclosed a traditional extrusion device and process. Extrusion is the "act or process of extruding" and extrude is defined as "[t]o shape (metal or plastic, for example) by forcing through a die." *See, e.g.,* The American Heritage Dictionary. In contrast, the newly invented molding process gives the tie different characteristics than the extruded tie or member of the '078 Patent.

Another unique feature of the invention is solving the problem of uniformly filling a

long mold. Due to the nature of a long mold, it is nearly impossible – if not impossible – to control the density of the mixture that is extruded introduced into a long mold, because the pressure varies, and the internal friction along the inside of the mold varies. In order to control the density and ensure consistent filling of the mold and integrity of the molded member, which is related to the strength of the member, the invention preferably uses a piston, brake and gearing, in conjunction with an extruder during the filling of the mold. Rather than filling a large void in an empty mold, a very small space is filled near or up against the face of the piston plate, and the piston is continually being moved away from the filled portion of the mold, preferably by a gear and a brake, which exerts resistance, which may also be preprogrammed to keep the density constant or variable as the mold is filled. This enables the formation of a member, with more uniform characteristics and enhanced structural integrity.

Independent Claim 14 has been amended to specify that the composite in the application is used for molding and molding applications and that the composite is heated by frictional mixing in a closed chamber mixer, whereas the '078 Patent used such composite in extrusion and primarily formation of the member by extrusion into a die, with the option of molding being briefly mentioned. Also, while the '078 Patent requires mica as a reinforcing filler, the new application discloses a variety of fillers which could be used. Also, because of improvements in the invented mixing technology disclosed in the application, it is not necessary to limit the size of the rubbery polymeric component such that about 90% by-weight will not pass through a hundred-mesh screen. The manner of mixing the composite materials by friction until the components reach a temperature of about 380 to about 440 degrees Fahrenheit prior to molding is also novel. Further, Applicants have amended their

claims by modifying the ranges of percentages of the thermoplastic polymer.

Independent Claim 71 and the claims that depend from it have been added to claim the members that have a varied density, wherein the density of the member is controlled during the filling of the mold. There are no such teachings in the '078 Patent.

Independent Claim 75 and the claims that depend from it are directed to a novel molded member comprised of the composite mixture, wherein at least one side surface is textured. This gives the molded member unique characteristics when placed upon or between ballast or other substrate. There are no such teachings in the '078 Patent.

Independent Claim 83 and the claims that depend from it are directed to a novel method for making a molded member comprised of the composite mixture, wherein at least one side surface is textured, and variations of the manner of texturing. There are no such teachings in the '078 Patent.

Independent Claim 91 and the claims that depend from it are directed to a novel system for supporting railroad rails using a textured tie placed upon or between ballast or other substrate. There are no such teachings in the '078 Patent.

Additionally, Applicants invented a cooling method for the molded member, wherein the member is taken out of the mold before the interior is cool. The member is then placed on a rack and rotated periodically to prevent warping.

Applicants respectfully traverse the Examiner's claim rejections on the basis that Applicants' invention possesses features and limitations not disclosed or claimed in the Sullivan, et al, '078 Patent. Applicants also respectfully traverse the Examiner's rejection because no single prior art reference, i.e., here the '078 Patent, discloses every limitation cited in the claim. A claim is anticipated only if each and every element set forth in the

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claim(s) are found, either expressly or inherently described in a single prior art reference, and the identical invention must be shown in as complete detail as contained in the claim. It is not. Therefore, the amended and newly presented claims are patentable.

#### **CLAIM REJECTIONS - 35 U.S.C. § 103:**

Claims 30-32, and 35-40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sullivan et al. (U.S. Patent No. 5,886,078) as discussed above, on the basis that the specific molding steps are purportedly conventional to the molding arts and would have purportedly been obvious to one skilled in the art.

Applicants respectfully traverse these rejections on that basis that such claims depend from an independent claim, which has been amended and is now patentable, and upon the basis that there is no evidence of record that that such steps are known or obvious to one skilled in the art.

#### **CONCLUSION**

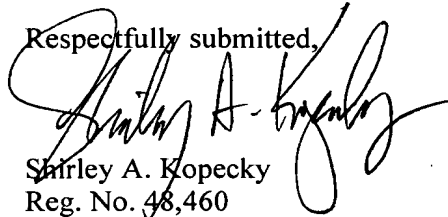
For the reasons submitted, Applicants respectfully submit that the added, unamended, and amended claims are patentable and completely overcome the Examiner's 35 U.S.C. 102 and 103 claim rejections, and that the Applicants' claims define novel structure and function, which is also unobvious. Again, not all elements of Applicants' invention are disclosed by the '078 Patent, thus Applicants' invention is not anticipated by the '078 Patent. Therefore, Applicants submit that these claims and amendments now place this application in condition for allowance. If the Examiner is of the opinion that the claims are not in condition for allowance then the Examiner is respectfully encouraged to contact the undersigned in order

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that this Application can be placed in allowable condition as soon as possible and without the need for further proceedings.

5 December 2003  
Date

Respectfully submitted,



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